FIG. 1

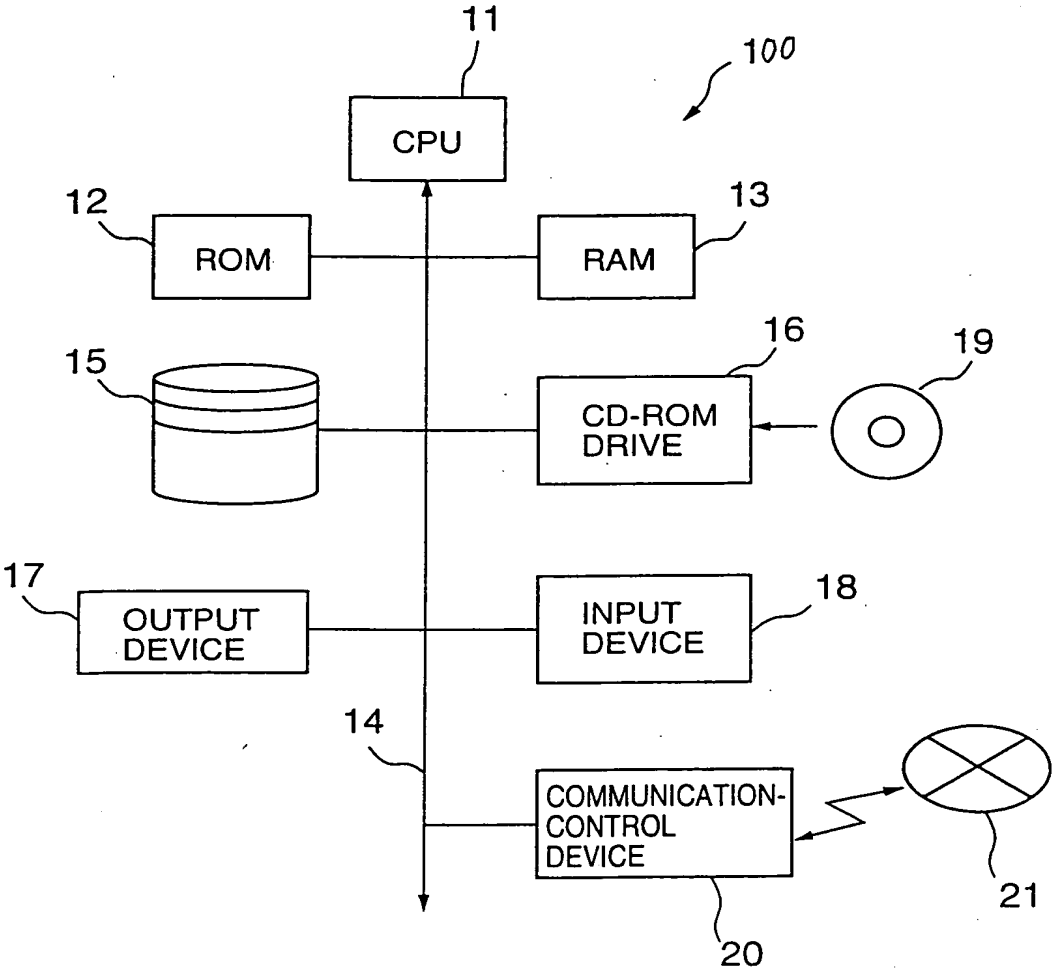

11
100
CPU
12
ROM
13
RAM
15
16
CD-ROM DRIVE
19
17
OUTPUT DEVICE
INPUT DEVICE
18
14
COMMUNICATION-CONTROL DEVICE
21
20

FIG. 2

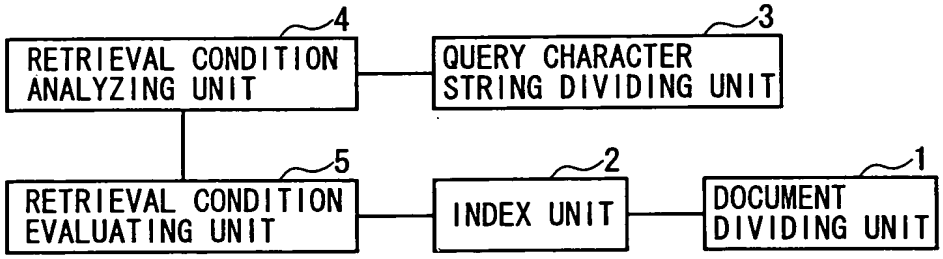


FIG. 3

INDEX KEYS	INDEX INFORMATION LIST	
	NUMBER OF DOCUMENTS	APPEARANCE INFORMATION PER DOCUMENT
A	1	{1, 1, (3)}
AA	1	{1, 2, (1, 2)}
AI	2	{2, 1, (1)} , {3, 1, (1)}
IU	2	{2, 1, (2)} , {4, 1, (1)}
IE	1	{3, 1, (2)}
U	1	{4, 1, (2)}
UE	1	{2, 1, (3)}
E	1	{3, 1, (3)}
EO	1	{2, 1, (4)}
O	1	{2, 1, (5)}

FIG. 4

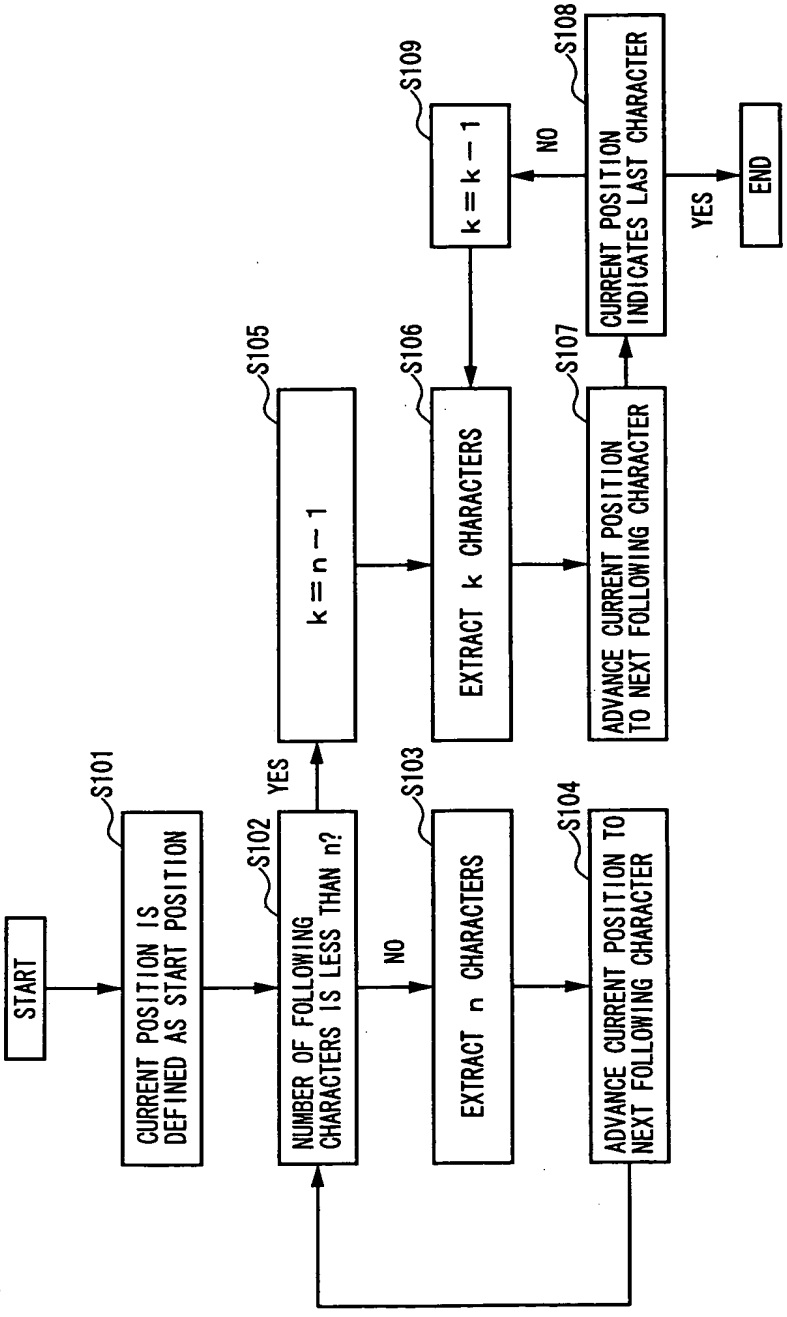

START
S101
CURRENT POSITION IS DEFINED AS START POSITION
S102
NUMBER OF FOLLOWING CHARACTERS IS LESS THAN n?
YES
NO
S103
EXTRACT n CHARACTERS
S104
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER
S105
k = n − 1
S106
EXTRACT k CHARACTERS
S107
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER
S108
CURRENT POSITION INDICATES LAST CHARACTER
NO
YES
S109
k = k − 1
END

FIG. 5

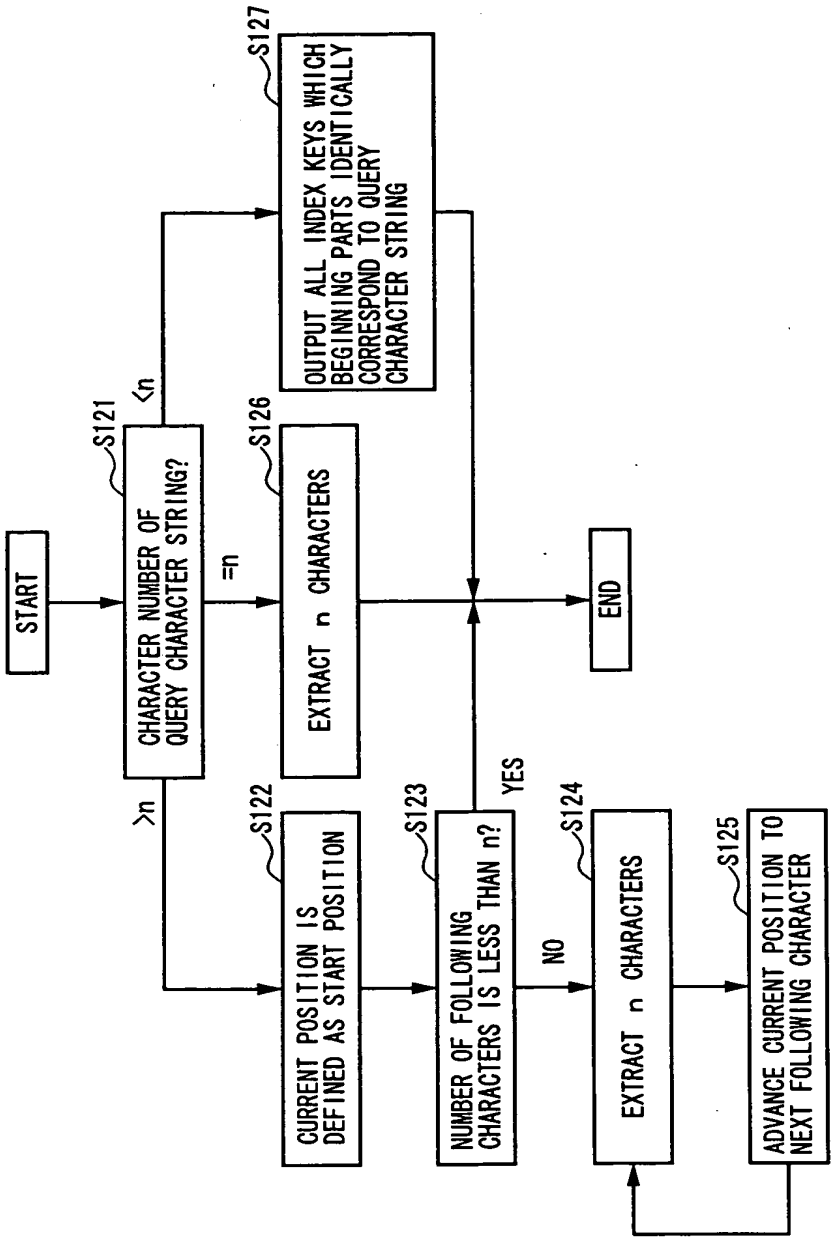

START
S121
CHARACTER NUMBER OF QUERY CHARACTER STRING?
<n
=n
>n
S126
EXTRACT n CHARACTERS
S127
OUTPUT ALL INDEX KEYS WHICH BEGINNING PARTS IDENTICALLY CORRESPOND TO QUERY CHARACTER STRING
END
S122
CURRENT POSITION IS DEFINED AS START POSITION
S123
NUMBER OF FOLLOWING CHARACTERS IS LESS THAN n?
YES
NO
S124
EXTRACT n CHARACTERS
S125
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER

FIG. 6

INDEX KEYS	INDEX INFORMATION LIST	
	NUMBER OF DOCUMENTS	APPEARANCE INFORMATION PER DOCUMENT
A	3	{1, 3, (1, 2, 3)} , {2, 1, (1)} , 3, 1, (1)}
AA	1	{1, 2, (1, 2)}
AI	2	{2, 1, (1)} , {3, 1, (1)}
I	3	{2, 1, (2)} , {3, 1, (2)} , {4, 1, (1)}
IU	2	{2, 1, (2)} , {4, 1, (1)}
IE	1	{3, 1, (2)}
U	2	{2, 1, (3)} , {4, 1, (2)}
UE	1	{2, 1, (3)}
E	2	{2, 1, (4)} , {3, 1, (3)}
EO	1	{2, 1, (4)}
O	1	{2, 1, (5)}

FIG. 7

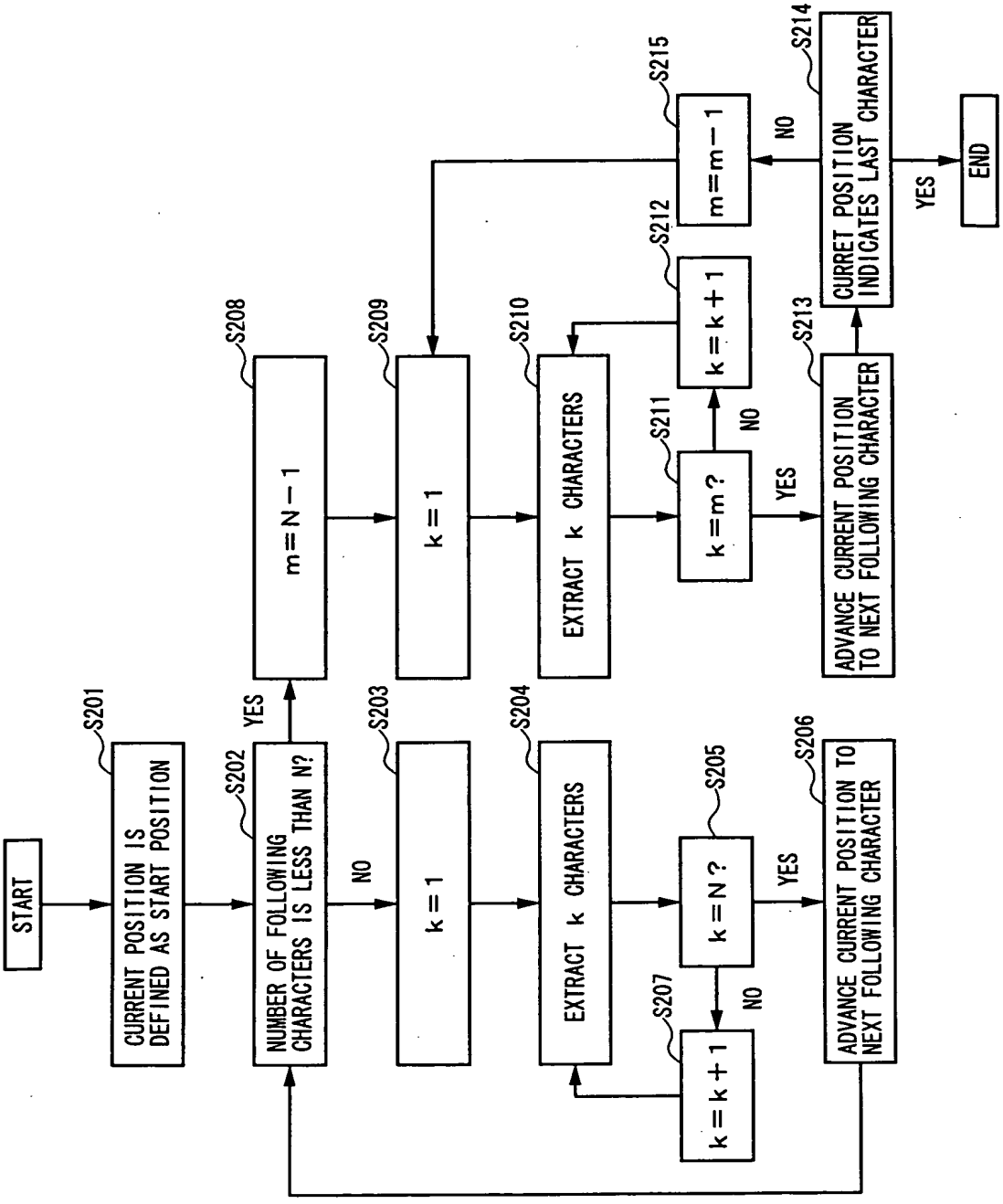

START
S201
CURRENT POSITION IS DEFINED AS START POSITION
S202
NUMBER OF FOLLOWING CHARACTERS IS LESS THAN N?
YES
NO
S203
k = 1
S204
EXTRACT k CHARACTERS
S205
k = N ?
YES
NO
S206
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER
S207
k = k + 1
S208
m = N − 1
S209
k = 1
S210
EXTRACT k CHARACTERS
S211
k = m ?
YES
NO
S212
k = k + 1
S213
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER
S214
CURRET POSITION INDICATES LAST CHARACTER
YES
NO
S215
m = m − 1
END

FIG. 8

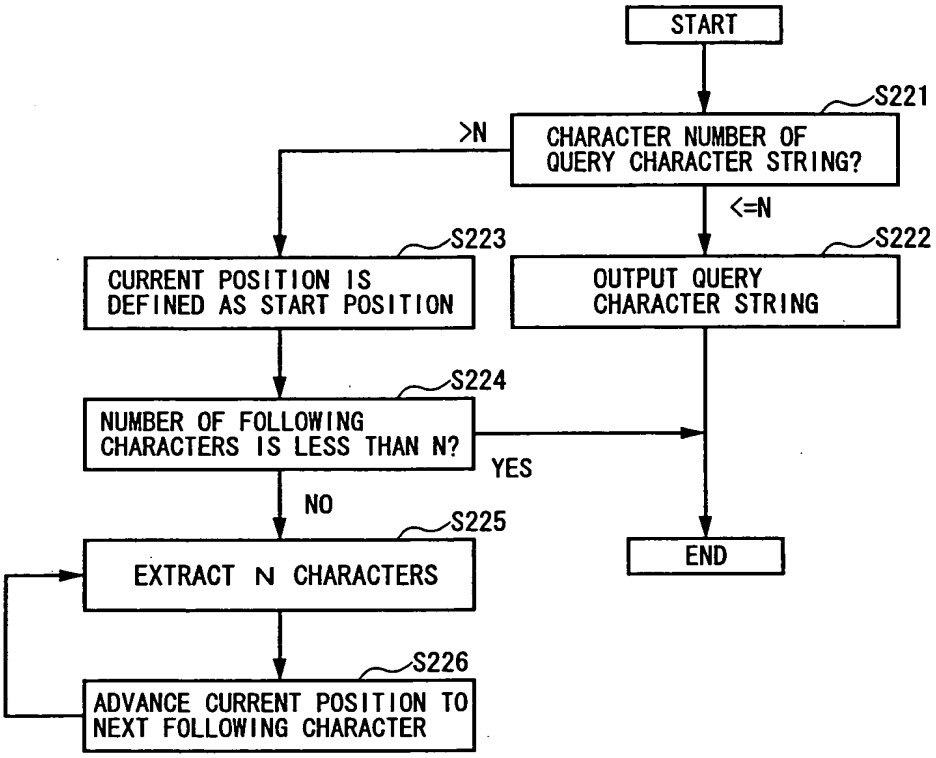

START
S221
CHARACTER NUMBER OF QUERY CHARACTER STRING?
>N
<=N
S223
CURRENT POSITION IS DEFINED AS START POSITION
S222
OUTPUT QUERY CHARACTER STRING
S224
NUMBER OF FOLLOWING CHARACTERS IS LESS THAN N?
YES
NO
S225
EXTRACT N CHARACTERS
END
S226
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER

FIG. 9

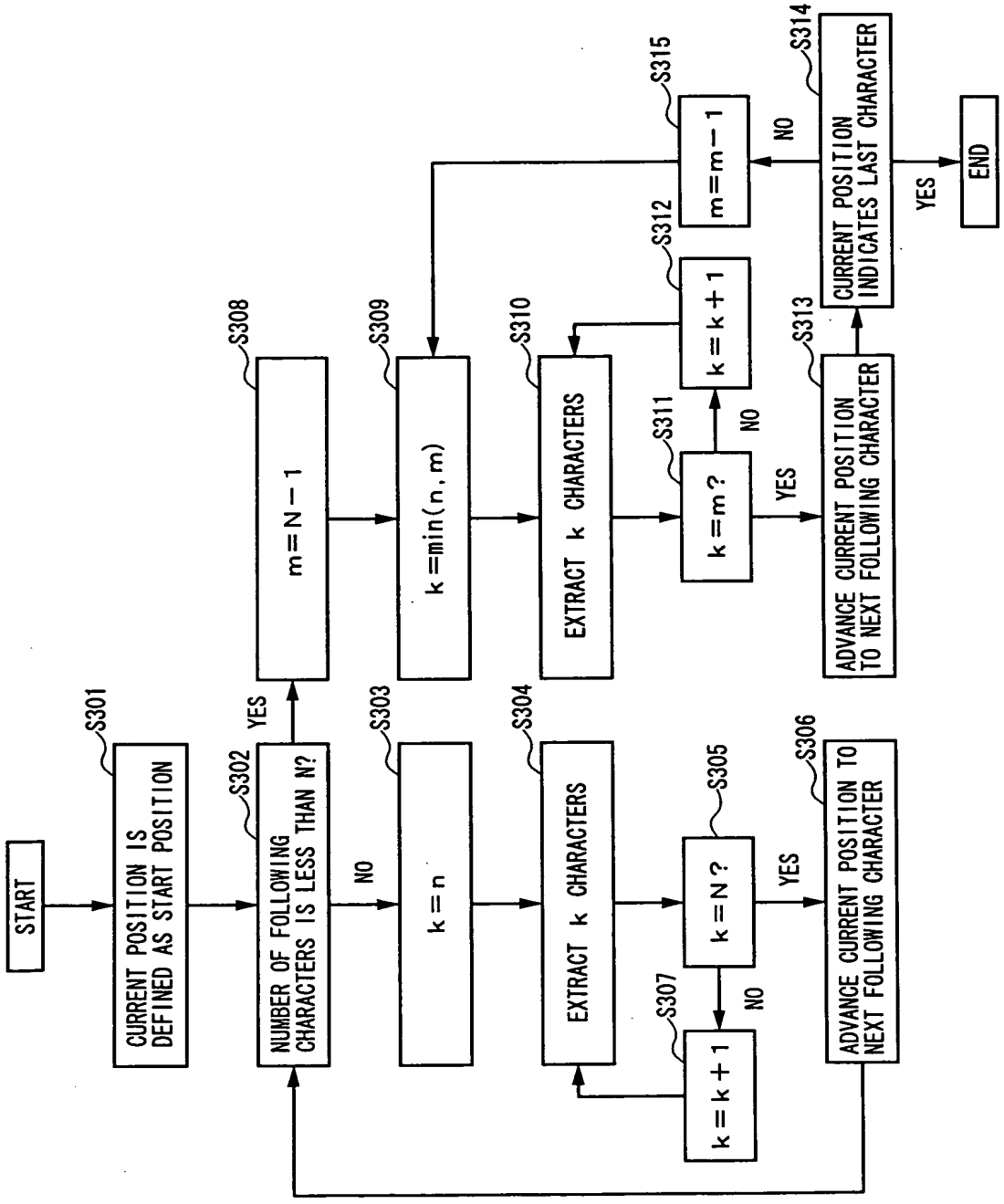

START
CURRENT POSITION IS DEFINED AS START POSITION
S301
NUMBER OF FOLLOWING CHARACTERS IS LESS THAN N?
S302
YES
NO
m=N−1
S308
k=n
S303
k=min(n,m)
S309
EXTRACT k CHARACTERS
S304
EXTRACT k CHARACTERS
S310
k=N?
S305
YES
NO
k=m?
S311
YES
NO
k=k+1
S307
k=k+1
S312
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER
S306
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER
S313
m=m−1
S315
CURRENT POSITION INDICATES LAST CHARACTER
S314
NO
YES
END

FIG. 10

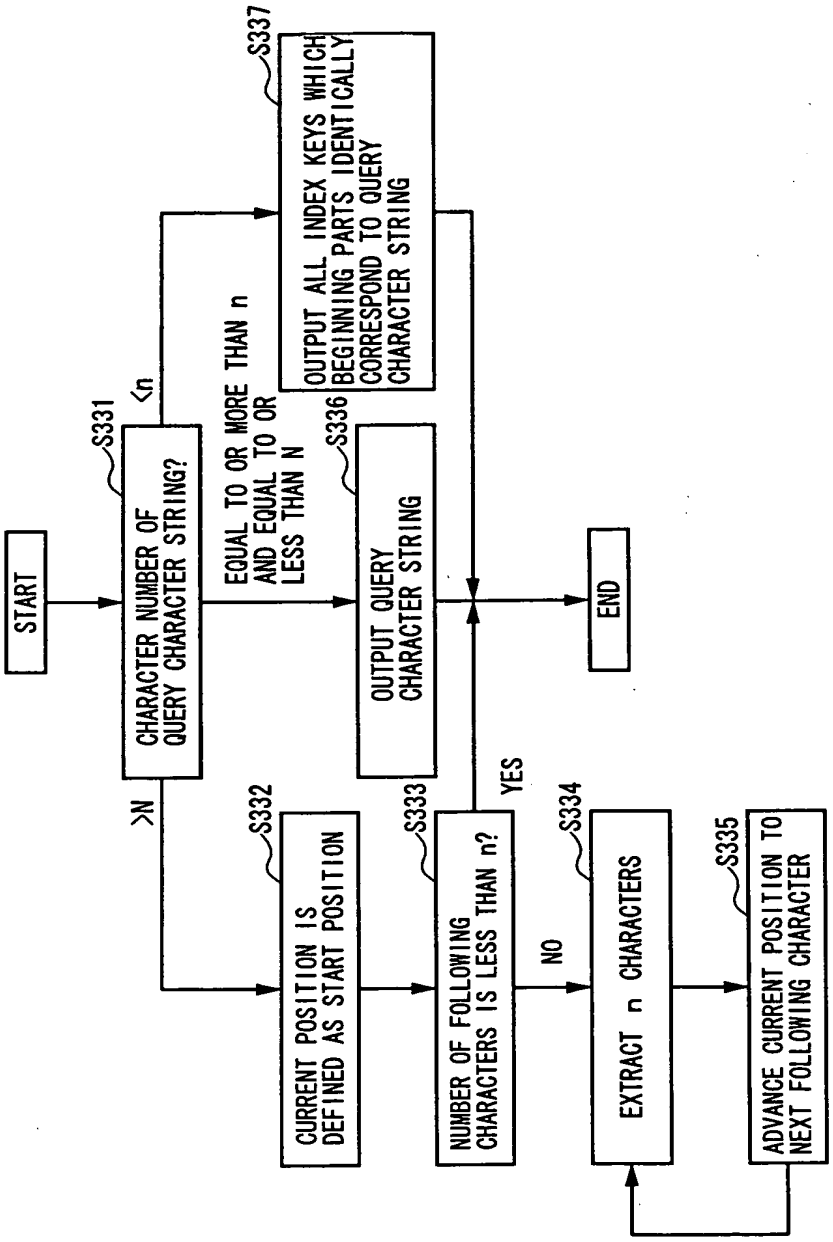

START
S331
CHARACTER NUMBER OF QUERY CHARACTER STRING?
<n
EQUAL TO OR MORE THAN n AND EQUAL TO OR LESS THAN N
S337
OUTPUT ALL INDEX KEYS WHICH BEGINNING PARTS IDENTICALLY CORRESPOND TO QUERY CHARACTER STRING
S336
OUTPUT QUERY CHARACTER STRING
END
>N
S332
CURRENT POSITION IS DEFINED AS START POSITION
S333
NUMBER OF FOLLOWING CHARACTERS IS LESS THAN n?
YES
NO
S334
EXTRACT n CHARACTERS
S335
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER

FIG. 11

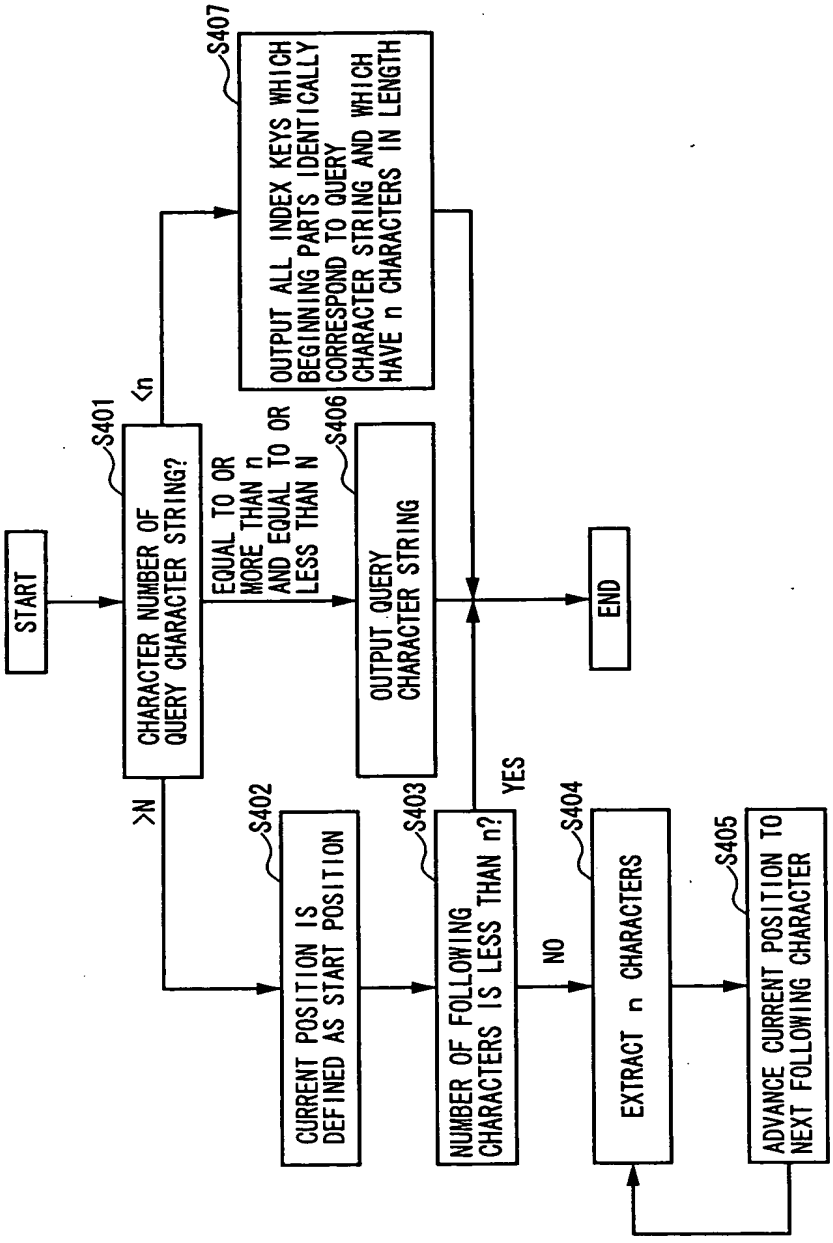

START
S401
CHARACTER NUMBER OF QUERY CHARACTER STRING?
<n
EQUAL TO OR MORE THAN n AND EQUAL TO OR LESS THAN N
>N
S406
OUTPUT QUERY CHARACTER STRING
S407
OUTPUT ALL INDEX KEYS WHICH BEGINNING PARTS IDENTICALLY CORRESPOND TO QUERY CHARACTER STRING AND WHICH HAVE n CHARACTERS IN LENGTH
END
S402
CURRENT POSITION IS DEFINED AS START POSITION
S403
NUMBER OF FOLLOWING CHARACTERS IS LESS THAN n?
YES
NO
S404
EXTRACT n CHARACTERS
S405
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER

FIG. 12

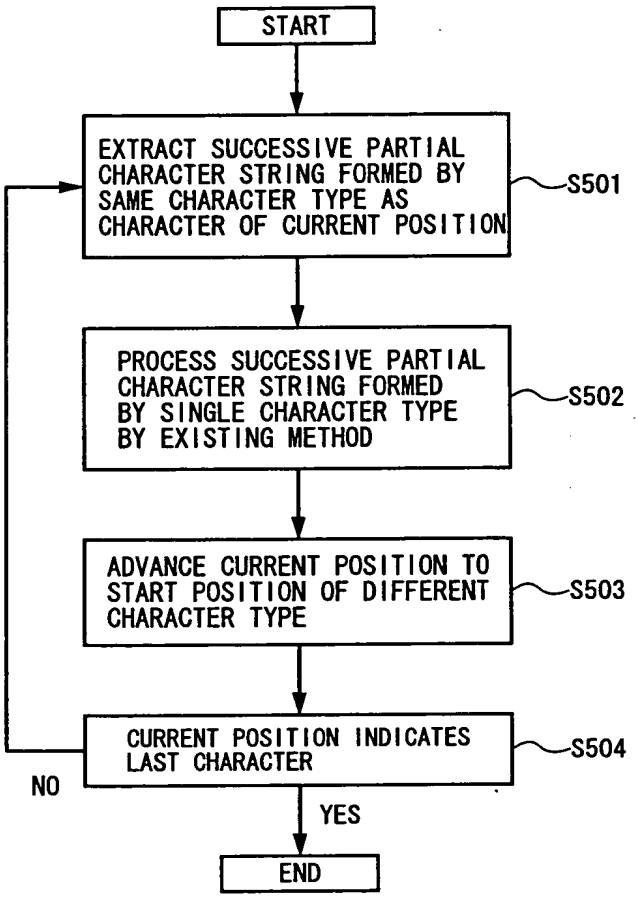

START
EXTRACT SUCCESSIVE PARTIAL CHARACTER STRING FORMED BY SAME CHARACTER TYPE AS CHARACTER OF CURRENT POSITION
S501
PROCESS SUCCESSIVE PARTIAL CHARACTER STRING FORMED BY SINGLE CHARACTER TYPE BY EXISTING METHOD
S502
ADVANCE CURRENT POSITION TO START POSITION OF DIFFERENT CHARACTER TYPE
S503
CURRENT POSITION INDICATES LAST CHARACTER
S504
NO
YES
END

FIG. 13

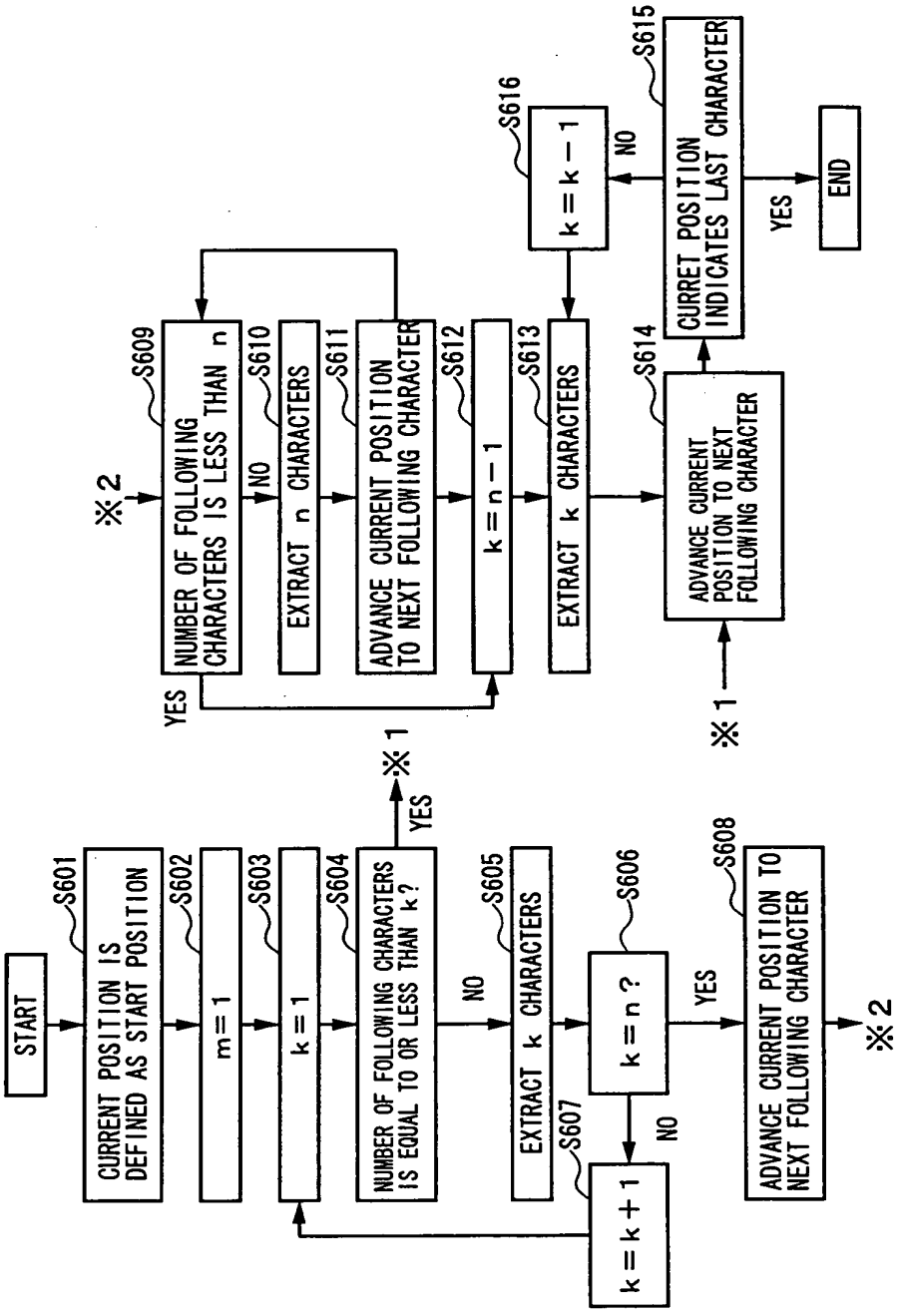

START
S601
CURRENT POSITION IS DEFINED AS START POSITION
S602
m = 1
S603
k = 1
S604
NUMBER OF FOLLOWING CHARACTERS IS EQUAL TO OR LESS THAN k?
YES
※1
NO
S605
EXTRACT k CHARACTERS
S606
k = n ?
YES
S608
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER
※2
NO
S607
k = k + 1
※2
S609
NUMBER OF FOLLOWING CHARACTERS IS LESS THAN n
YES
NO
S610
EXTRACT n CHARACTERS
S611
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER
S612
k = n - 1
S613
EXTRACT k CHARACTERS
S614
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER
※1
S615
CURRET POSITION INDICATES LAST CHARACTER
YES
END
NO
S616
k = k - 1

FIG. 14

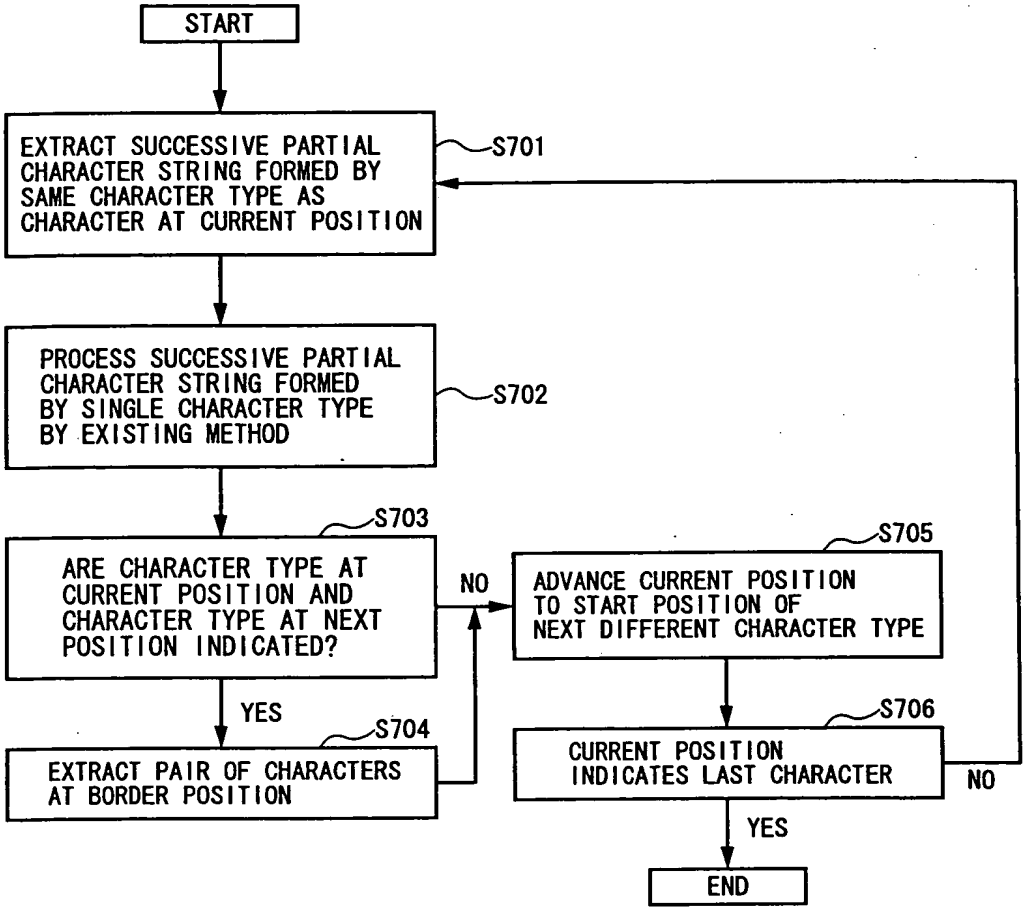

START
EXTRACT SUCCESSIVE PARTIAL CHARACTER STRING FORMED BY SAME CHARACTER TYPE AS CHARACTER AT CURRENT POSITION
S701
PROCESS SUCCESSIVE PARTIAL CHARACTER STRING FORMED BY SINGLE CHARACTER TYPE BY EXISTING METHOD
S702
S703
ARE CHARACTER TYPE AT CURRENT POSITION AND CHARACTER TYPE AT NEXT POSITION INDICATED?
NO
YES
S704
EXTRACT PAIR OF CHARACTERS AT BORDER POSITION
S705
ADVANCE CURRENT POSITION TO START POSITION OF NEXT DIFFERENT CHARACTER TYPE
S706
CURRENT POSITION INDICATES LAST CHARACTER
NO
YES
END

FIG. 15

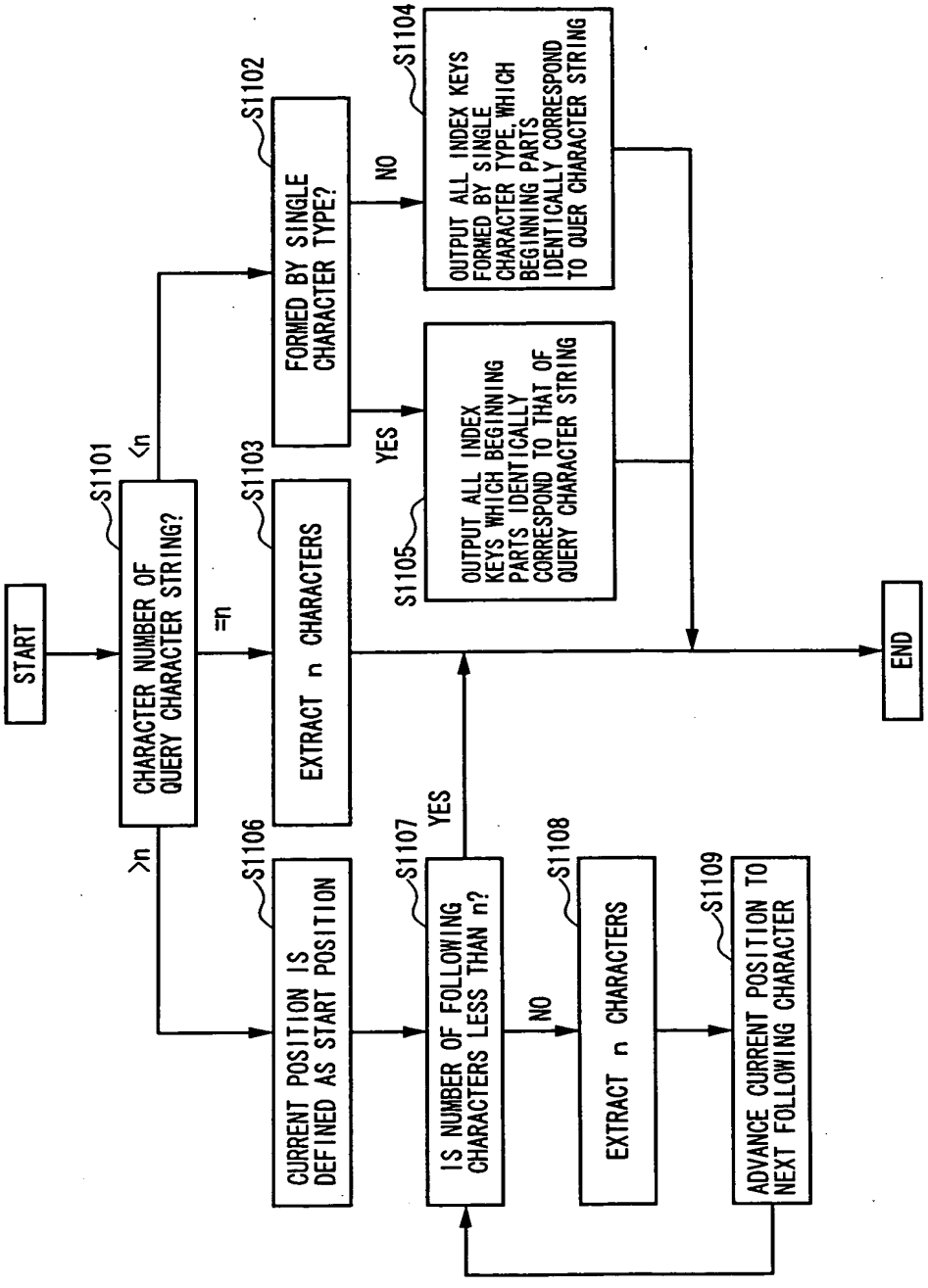
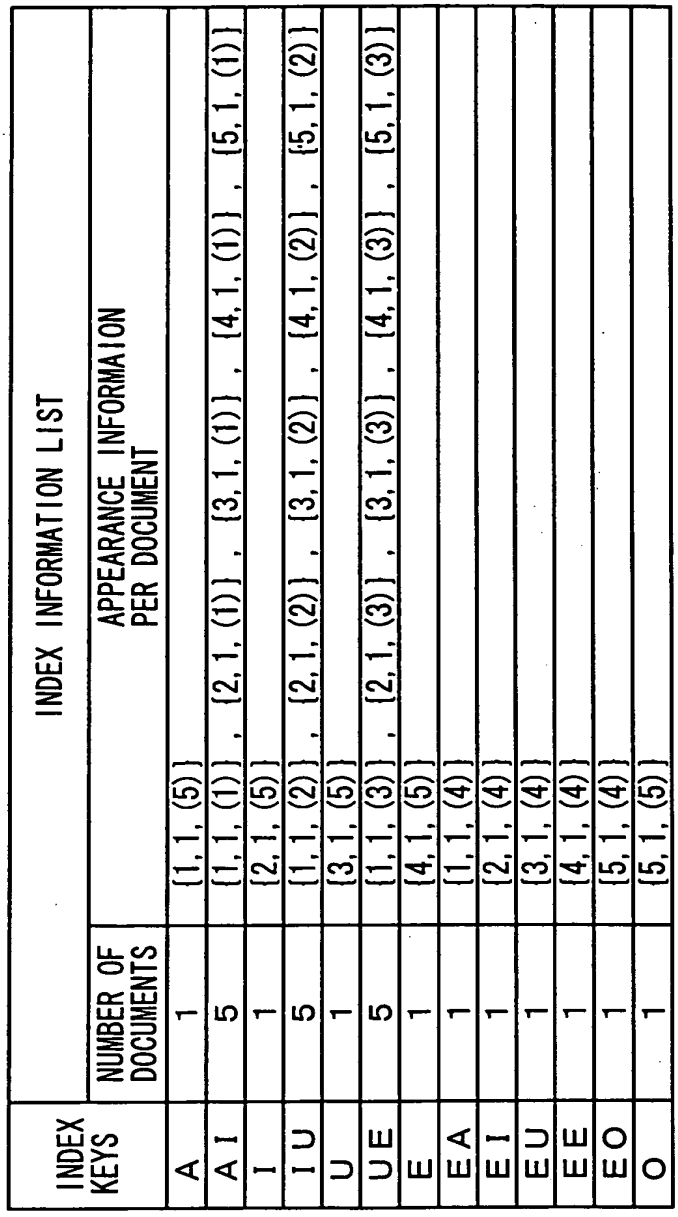

START
CHARACTER NUMBER OF QUERY CHARACTER STRING?
S1101
<n
=n
>n
FORMED BY SINGLE CHARACTER TYPE?
S1102
NO
YES
OUTPUT ALL INDEX KEYS FORMED BY SINGLE CHARACTER TYPE, WHICH BEGINNING PARTS IDENTICALLY CORRESPOND TO QUER CHARACTER STRING
S1104
EXTRACT n CHARACTERS
S1103
OUTPUT ALL INDEX KEYS WHICH BEGINNING PARTS IDENTICALLY CORRESPOND TO THAT OF QUERY CHARACTER STRING
S1105
END
CURRENT POSITION IS DEFINED AS START POSITION
S1106
IS NUMBER OF FOLLOWING CHARACTERS LESS THAN n?
S1107
YES
NO
EXTRACT n CHARACTERS
S1108
ADVANCE CURRENT POSITION TO NEXT FOLLOWING CHARACTER
S1109

FIG. 16



INDEX KEYS	INDEX INFORMATION LIST	
	NUMBER OF DOCUMENTS	APPEARANCE INFORMATION PER DOCUMENT
A	1	{1, 1, (5)}
A I	5	{1, 1, (1)} , {2, 1, (1)} , {3, 1, (1)} , {4, 1, (1)} , {5, 1, (1)}
I	1	{2, 1, (5)}
I U	5	{1, 1, (2)} , {2, 1, (2)} , {3, 1, (2)} , {4, 1, (2)} , {5, 1, (2)}
U	1	{3, 1, (5)}
U E	5	{1, 1, (3)} , {2, 1, (3)} , {3, 1, (3)} , {4, 1, (3)} , {5, 1, (3)}
E	1	{4, 1, (5)}
E A	1	{1, 1, (4)}
E I	1	{2, 1, (4)}
E U	1	{3, 1, (4)}
E E	1	{4, 1, (4)}
E O	1	{5, 1, (4)}
O	1	{5, 1, (5)}

FIG. 17

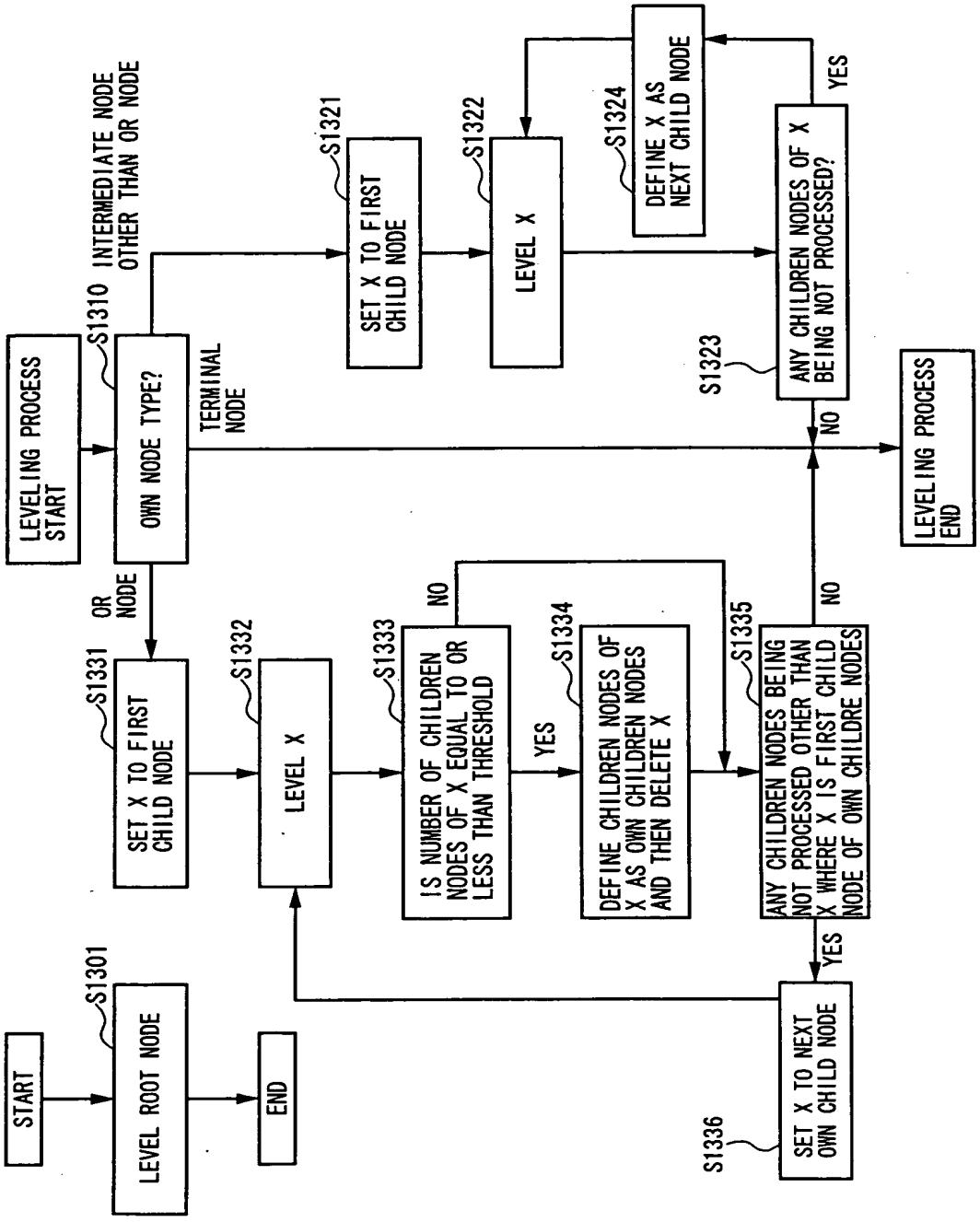

START
S1301
LEVEL ROOT NODE
END
S1310
OWN NODE TYPE?
INTERMEDIATE NODE OTHER THAN OR NODE
TERMINAL NODE
OR NODE
S1321
SET X TO FIRST CHILD NODE
S1322
LEVEL X
S1324
DEFINE X AS NEXT CHILD NODE
S1323
ANY CHILDREN NODES OF X BEING NOT PROCESSED?
YES
NO
LEVELING PROCESS START
LEVELING PROCESS END
S1331
SET X TO FIRST CHILD NODE
S1332
LEVEL X
S1333
IS NUMBER OF CHILDREN NODES OF X EQUAL TO OR LESS THAN THRESHOLD
NO
YES
S1334
DEFINE CHILDREN NODES OF X AS OWN CHILDREN NODES AND THEN DELETE X
S1335
ANY CHILDREN NODES BEING NOT PROCESSED OTHER THAN X WHERE X IS FIRST CHILD NODE OF OWN CHILDRE NODES
NO
YES
S1336
SET X TO NEXT OWN CHILD NODE

FIG. 18

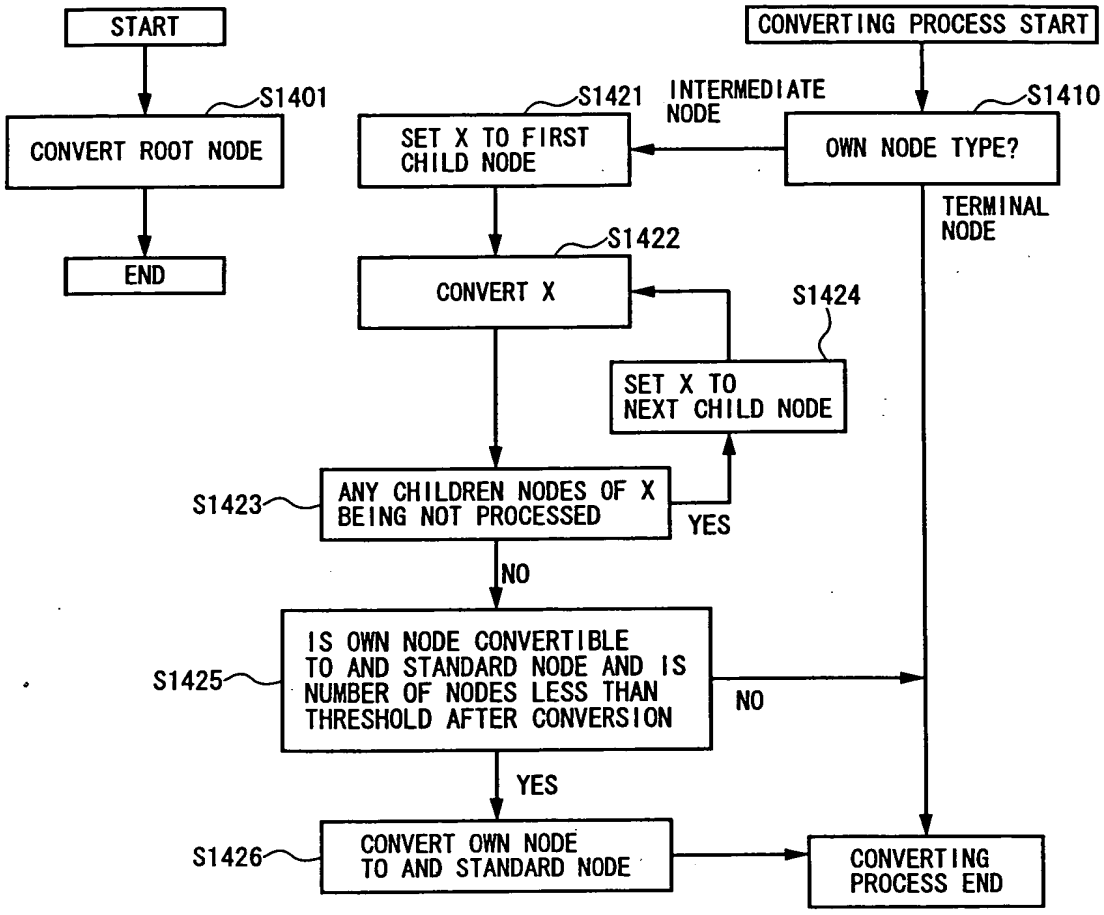

START
CONVERT ROOT NODE
S1401
END
CONVERTING PROCESS START
S1410
OWN NODE TYPE?
INTERMEDIATE NODE
TERMINAL NODE
S1421
SET X TO FIRST CHILD NODE
S1422
CONVERT X
S1424
SET X TO NEXT CHILD NODE
S1423
ANY CHILDREN NODES OF X BEING NOT PROCESSED
YES
NO
S1425
IS OWN NODE CONVERTIBLE TO AND STANDARD NODE AND IS NUMBER OF NODES LESS THAN THRESHOLD AFTER CONVERSION
NO
YES
S1426
CONVERT OWN NODE TO AND STANDARD NODE
CONVERTING PROCESS END

FIG. 19

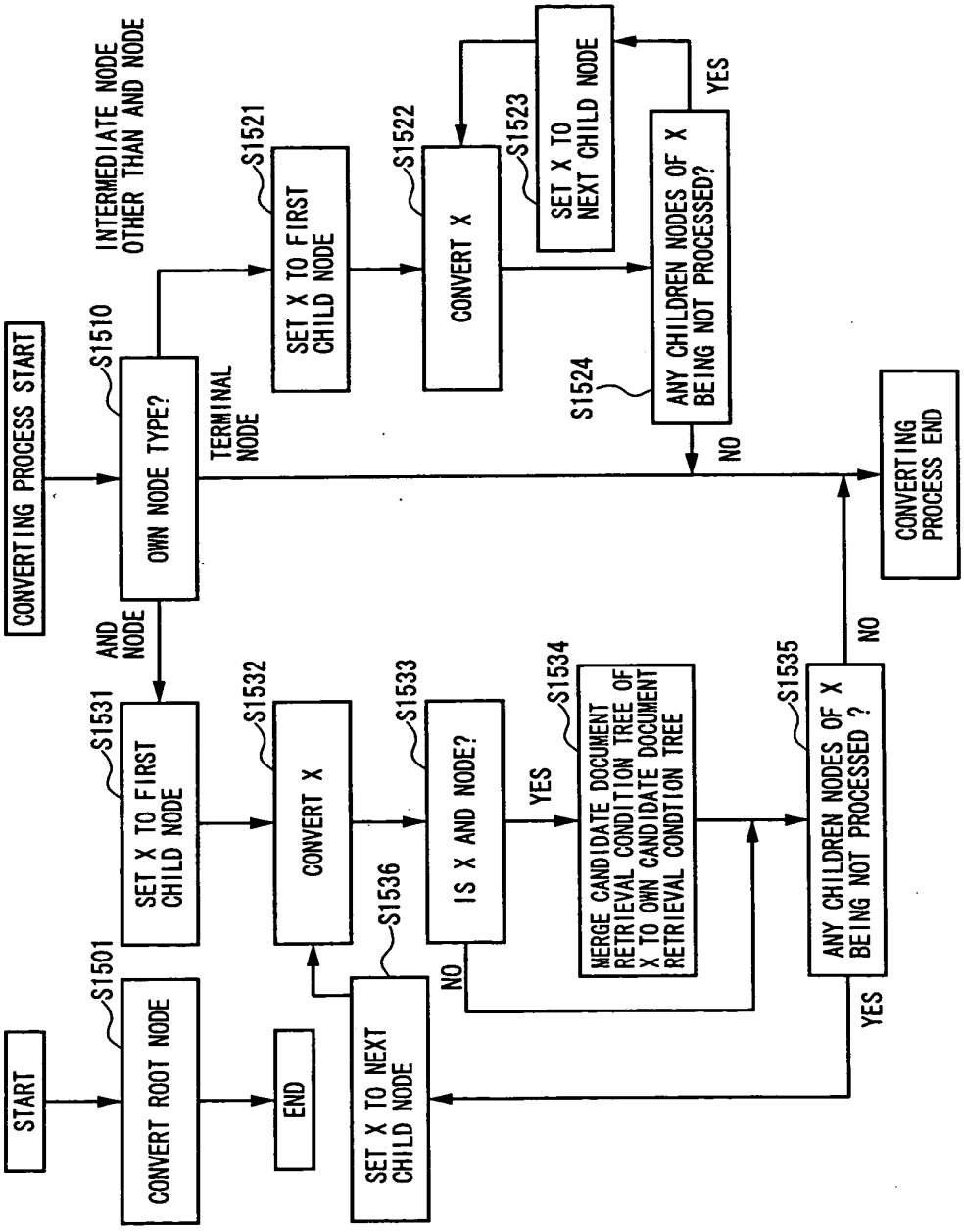
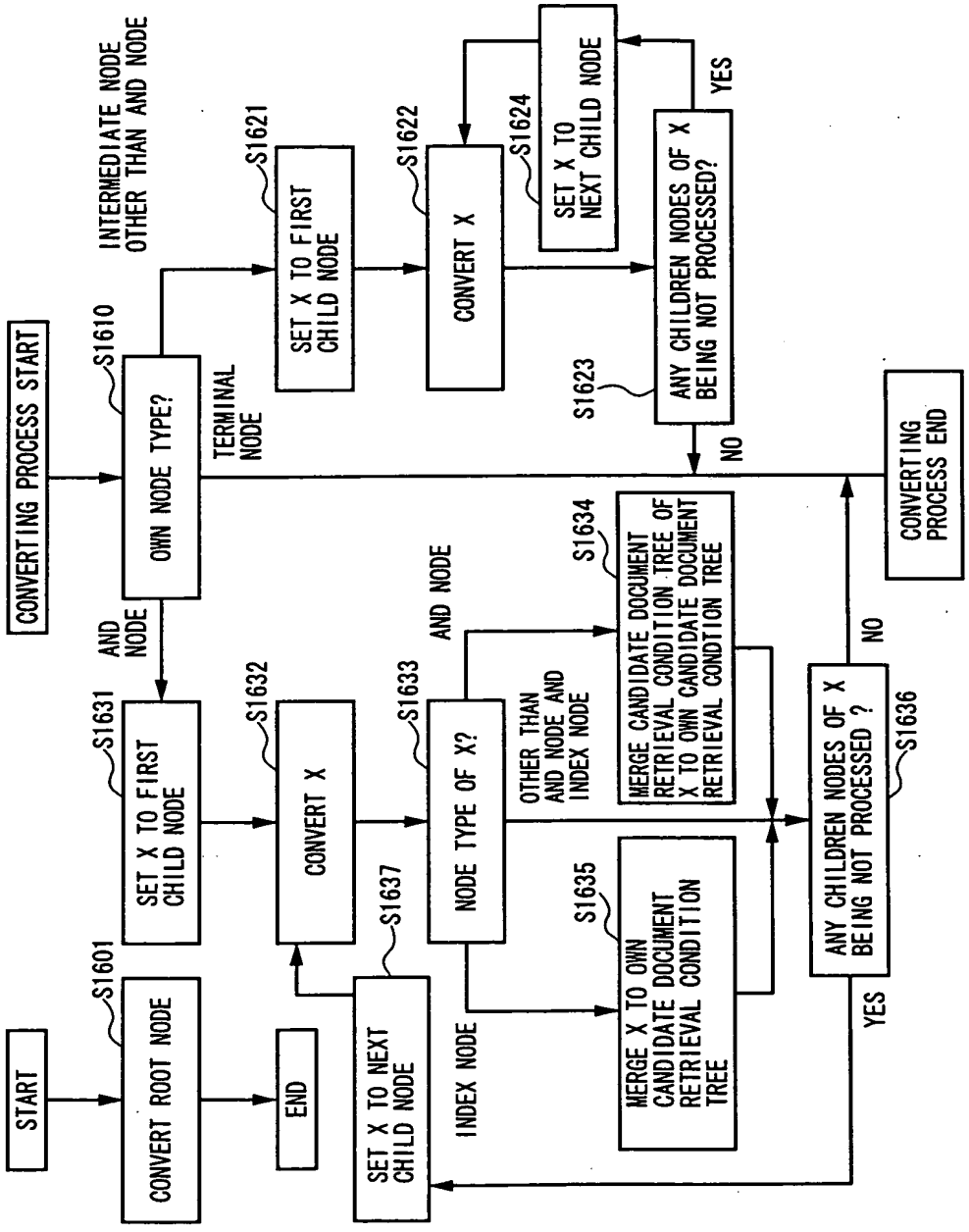

START
CONVERT ROOT NODE
S1501
END
CONVERTING PROCESS START
OWN NODE TYPE?
S1510
INTERMEDIATE NODE OTHER THAN AND NODE
TERMINAL NODE
AND NODE
SET X TO FIRST CHILD NODE
S1521
CONVERT X
S1522
SET X TO NEXT CHILD NODE
S1523
ANY CHILDREN NODES OF X BEING NOT PROCESSED?
S1524
YES
NO
CONVERTING PROCESS END
SET X TO FIRST CHILD NODE
S1531
CONVERT X
S1532
IS X AND NODE?
S1533
YES
MERGE CANDIDATE DOCUMENT RETRIEVAL CONDITION TREE OF X TO OWN CANDIDATE DOCUMENT RETRIEVAL CONDITION TREE
S1534
ANY CHILDREN NODES OF X BEING NOT PROCESSED ?
S1535
NO
YES
SET X TO NEXT CHILD NODE
S1536
NO

FIG. 20


START
CONVERT ROOT NODE
S1601
END
SET X TO NEXT CHILD NODE
INDEX NODE
S1637
NODE TYPE OF X?
S1633
OTHER THAN AND NODE AND INDEX NODE
MERGE X TO OWN CANDIDATE DOCUMENT RETRIEVAL CONDITION TREE
S1635
CONVERT X
S1632
SET X TO FIRST CHILD NODE
S1631
AND NODE
MERGE CANDIDATE DOCUMENT RETRIEVAL CONDITION TREE OF X TO OWN CANDIDATE DOCUMENT RETRIEVAL CONDTION TREE
S1634
AND NODE
ANY CHILDREN NODES OF X BEING NOT PROCESSED ?
S1636
YES
NO
CONVERTING PROCESS END
CONVERTING PROCESS START
OWN NODE TYPE?
S1610
TERMINAL NODE
INTERMEDIATE NODE OTHER THAN AND NODE
SET X TO FIRST CHILD NODE
S1621
CONVERT X
S1622
SET X TO NEXT CHILD NODE
S1624
ANY CHILDREN NODES OF X BEING NOT PROCESSED?
S1623
YES
NO